

Psychological Bulletin

EDITED BY

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PUBLISHED MONTHLY BY THE

PSYCHOLOGICAL REVIEW COMPANY

NORTH QUEEN ST., LANCASTER, PA.,

AND PRINCETON, N. J.

AGENTS: G. E. STECHERT & CO., LONDON (8 Star Yard, Carey St., W. C.);
LEIPZIG (Koenigstr., 37); PARIS (16, rue de Condé)

Entered as second-class matter January 22, 1904, at the post-office at Lancaster, Pa., under
Act of Congress of March 3, 1879

Psychological Review Publications

EDITED BY

HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)

JOHN B. WATSON, JOHNS HOPKINS UNIVERSITY (*J. of Exp. Psych.*)

JAMES R. ANGELL, UNIVERSITY OF CHICAGO (*Monographs*)

SHEPHERD I. FRANZ, GOVT. HOSPT. FOR INSANE (*Bulletin*)

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LEIPZIG (Koenigstr., 37); PARIS (16, rue de Condé)

Vol. XIV. No. 7.

July, 1917

THE
PSYCHOLOGICAL BULLETIN

GENERAL REVIEWS AND SUMMARIES

SPACE ILLUSIONS

BY HARVEY CARR

University of Chicago

Peterson (1) gives a description and a suggestive analysis of two illusions of direction. The first few moments in a new situation are critical; the attitude first developed is likely to persist. Several favorable conditions for the development of an illusion are given: inability to maintain or transfer the correct orientation in previous situations to the new one, due to sleep, travelling in the night, mental confusion, etc.; cloudy weather so that the old orienting attitudes toward the sun can not be utilized; and unusual directions of the roads or streets with their false suggestive effect. There exist probably individual differences as to the features of the environment upon which one's orienting attitude depends. The existence of any innate sense of direction is denied.

Pintner and Anderson (2) presented the Müller-Lyer illusion to groups of children of ages 6 to 14 years, to feeble-minded children of a mental age of 9 years, and to adults. The number per group ranged from 13 to 38. As the age increased there was a decrease in the size of the illusion and in the range of individual variability, though the decrease was not at all uniform. The differences for age were so small and the group variability so great that the test can not be used as diagnostic of age. The influence of age is due in part to greater experience in judging lines and in part to greater attentive control. Contrast is also regarded as a factor.

The paper of Southard (3) was designed to illustrate the method of Royce's logical seminary. Most delusions are pragmatic, disorders of will and attitude, and they are correlated with frontal

lobe disturbances. The frontal lobe is regarded as an organ for the elaboration of motor attitudes. The attempt is made to suggest an analysis of these delusional attitudes in terms of grammatical verbal concepts such as mood, tense, voice, person and gender. For example, delusions of grandeur are characterized as active, delusional persecutions as passive, and states of self-accusation as reflexive.

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PSYCHOLOGY OF TESTIMONY

BY GUY M. WHIPPLE

University of Illinois

The past two years have brought forth relatively little in the field of testimony and the interruption of communication with Europe has made it impossible to obtain copies of periodicals in which some of the references are to be found.

Altmann (1) contributes an anecdote to illustrate how completely a group of persons may be misled in their understanding of the words of one of their number when all are under the sway of emotional excitement. The person in question was accused of speaking disrespectfully of Archduke Ferdinand: all his hearers testified against him, but his behavior was so at variance with this alleged speech that one of the judges was led to probe into the matter and succeeded in finding the source of the auditory confusion.

Gross (2) prints a questionnaire for the purpose of obtaining and classifying information concerning the peculiar cases sometimes reported in trials in which a certain sound (cry, whistle, bell, etc.) is reported as clearly heard by several witnesses at some distance from the source of the sound but as not heard by other witnesses who were nearer the source. The questionnaire pertains primarily to the physical aspects of these situations, though it is evident that mental factors may also be operative.

The two other references to Gross (3, 4) were not available when this review was prepared.

3 Henning (5) calls attention to the fact that those who, since the earlier experiments of Wertheimer and Klein, have tried to use the association method for the diagnosis of knowledge of matters of fact have by no means been uniformly successful. One of the main difficulties lies in the circumstance that it is not easy to produce in the laboratory, conditions that sufficiently resemble those of daily life. To meet this difficulty Henning commends the resort to the "movies," which are always accessible and which supply situations full of life and with emotional backgrounds. Another difficulty is inherent in the association method itself, as ordinarily conducted, and this Henning would meet by the use of what he terms the "double association" method. The plan is to utter the stimulus word as usual but to follow this after about one second with another or "disturbing" word (*Störungswort*) and to have the subject respond only after the second word is uttered. As would be anticipated, the subject commonly responds with a word that "fits" the stimulus word as it is qualified or restricted by the disturbing word. In other words, the experiment takes on somewhat the color of a "controlled association" experiment. As we understand it, it is much more difficult to avoid the "set" given to the association by this double stimulus than it is to avoid the "set" that would be supplied by a single stimulus word. In any event critical stimulus words are almost invariably followed by delayed responses, so that the efficiency of the method for diagnosis is markedly augmented by this plan of procedure. Repetition of the test, even after the lapse of considerable time, yields results much like the first testing.

5 The contention of von Karman (6) is that, while the last two decades have seen the accumulation of a large mass of data concerning the psychology of testimony, and while many judges and lawyers are not unmindful of these data and of their importance, yet the data are far from accessible. What is wanted is an arrangement of all this material in such a form that it can be gotten at by the questioner when actually at work taking testimony. The arrangement must be made with the needs of the man in the field in view rather than to suit the theoretical investigator and psychologist. The author then sets out a provisional schema, a sort of scaffolding, for the construction of this working guide for questioners. The main points in this schema are (with some paraphrasing) as follows: we must consider on the one hand the reliability of the witness as a testifier, on the other hand the objective truthfulness of his

testimony. His reliability hinges on two things: (1) the exactness of his observation and (2) the correctness of his report of his observation. Exactness of observation is itself conditioned by general physical and mental condition (with numerous subdivisions—eyesight, hyperesthesia, neuropathic tendency, suggestibility, undeveloped mentality, arrested mentality, etc.), also by the spatial and temporal conditions under which the observation was made (whether favorable or unfavorable), and also on the freedom of the observer from other distracting mental processes, whether intellectual or affective, at the time of observation. The correctness of the report upon this observation hinges upon the general retentive capacity of the witness, upon the length of time elapsed, upon the number of times he has given the testimony and also upon his use of words (the talkative, the taciturn, the man of scant vocabulary, each gives testimony that is affected by his capacity to translate what he remembers into speech). Finally, the objective truthfulness of any testimony must be controlled by checking it with all the known facts of the case and with the behavior of the accused and similar objective data with which it may be compared.

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PSYCHOTHERAPY

BY THOMAS VERNER MOORE

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Those interested in practical psychology will welcome the attempt of Rabbow (16) to trace out the first beginnings of psychotherapy, and will find in the doctrine of the ancients suggestions that are applicable even to-day. The present volume deals only with Greek and Roman concepts on the treatment of anger. It

includes much that is of interest in the history of the theoretical psychology of the emotions. Gregor's article (9) is an excellent introduction to the modern literature on psychotherapy. He divides the subject into two sections. I. Fundamental principles. Here he points to the interaction of body and mind as the source of a great multiplicity of symptoms. As Southard, e. g., has shown (*J. of Abnor. Psych.*, 1912) delusions that have reference to the body often rest upon bodily changes. He cites a number of excellent studies of the use of psychotherapy in internal medicine and pediatrics. He regards hydro- and electro-therapy and occupational cures to a large extent mental treatment. II. In the next section he considers special methods: (1) *Hypnosis*. He looks upon hypnosis as a phenomenon of dissociation and points out that, therefore, its effects must be local on the dissociated idea, but nevertheless advises its use in order to do quickly what would otherwise have to be accomplished by a long process of persuasion. (2) *Psychoanalysis*. He gives a short outline of fundamental Freudian concepts. He doubts that bringing the old emotion to light and the resultant abreaction represents the essential mechanism of the cure. He thinks that the most important adjuncts of psychoanalysis are clinical methods and especially the anamnesis which in most cases suffices by itself. He brings forward the criticisms that various authors have made against the Freudian postulates, and gives a short description of Jung's method of association. (3) *Persuasion*. This he looks upon as the method of widest application. It consists essentially in the physician's explaining the mental nature of the symptoms and helping the patient to overcome them by an insight into their mechanism.

Bjerre's work (2) on the history and practise of psychoanalysis is not the systematic treatise that the title indicates, but consists rather of a collection of essays on several persons prominent in the history of psychotherapy, a chapter on the nature of hypnosis, another being an extract from a case history and a final chapter on points of view and outlooks. Nevertheless of all the works the writer has seen on psychoanalysis it is the coolest, sanest presentation and the best work for any one unacquainted with the subject to choose for a first introduction. The chapter on "Psychoanalysis as a Science and Method of Treatment" is an excellent presentation of the Freudian doctrines. Bjerre seems to lay more stress on sublimation than Freud, who seeks his goal mainly through transfer. He again differs from Freud in accentuating the value

of conscious factors along with the unconscious in the production of psychoneuroses. Pfister (15), a seminary teacher in Zurich, already well known for his interesting psychoanalytic studies, has undertaken an introductory textbook on the history, theory and technique of psychoanalysis. Besides the usual matter on this subject he devotes a section to what he terms pedanalysis. By this he understands psychoanalysis of the young as practised by teachers rather than physicians. He advocates the use of psychoanalysis by teachers because of the large number of neurotic children, because the teacher sees many psychoses in their incipient stage, because physicians are not numerous enough to cope with the cases to be treated and for the most part have no appreciation of psychoanalytic methods. One will find in Ferenczi's (7) contributions to psychoanalysis a study of various psychotherapeutic problems from the extreme Freudian point of view. Coriat (4) supplies a long-felt want in giving the statistics of the results of psychoanalysis in a fairly extensive series of cases. He reports on 93 patients. Of these 46 were cured, 27 much improved, 11 improved and 9 were not improved.

Von Stauffenberg (21) gives an interesting account of his personal experience with psychotherapeutic methods. He finds that the personal suggestion of simple conversation will accomplish a great deal, but that hypnotic suggestion will do much more. Some of these cases are permanently cured by mere suggestion. But mere hypnotic suggestion often fails. It does so whenever the source of the difficulty lies in a buried emotion which causes a condition of mental strain. In such cases the emotion must be abreacted in the hypnotic state, as Frank suggested, by turning the subject's attention to his visual imagery. When this is done, the emotion at the base of his psychosis will reappear and be abreacted. A further group of cases cannot be cured by even this procedure. They are patients suffering from deep underlying conflicts between ideals and accomplishment. These are the cases which yield promptly to the Freudian psychoanalysis. Scott (19) reports ten cases treated by hypnotism: telegraphic neurosis, cured; hysterical paralysis, cured; tic, cured except during rare moments of excitement; choreiform movements; obsession, could not be hypnotized, but improved; masturbation, cured; hysterical chorea, could not be hypnotized, no improvement; traumatic paralysis, cured; stammering and persistent headache, stammering almost, headache completely cured; agoraphobia, cured. Wilkinson (23)

reports a number of cures obtained by hypnotism. These cases were: a functional abasia, hysterical torticollis, epileptiform convulsions in a boy of eleven following severe fright, neurasthenia, "spinal" trouble. Smyly (20) attempted to cure 32 cases by suggestion in hypnosis. He failed completely to hypnotize three. He attempted to produce operative anaesthesia on 16 cases; one of these was only slightly influenced. In another ether had to be used as an adjunct. The rest (8 of which were purely experimental) were reported as successful. In 8 cases of insomnia there was only one failure. In 6 cases of phobia and other psycho-neurotic symptoms there were only one complete cure and one case much improved. Moderate success was obtained in two alcoholics. Two cases of spasmodic torticollis were much improved. Of three cases of stammering two were cured, one was improved. Three cases, females, with abdominal symptoms were improved. One male after trial was referred to surgeons. Three cases with genito-urinary symptoms cured, the others could not be hypnotized. One case of excessive blushing and hyperidrosis of hands was cured with somnambulism plus psychoanalysis. Two cases of inveterate headache were only slightly relieved. Seven cases of ergophobia were all improved. Bernheim (1) gives a short résumé of the principal views of hypnotism and claims that he instituted modern psychotherapy when he pointed out that the therapy of suggestion is just as efficacious in the waking state as in the hypnotic state. He says that whatever phenomena can be produced in a subject by hypnosis may also be caused by suggestion without hypnosis. Profound hypnosis which abolishes mental activity abolishes also suggestibility. Suggestion, therefore, and not hypnosis lies at the basis of all psychotherapy.

A second edition of the already well known work of Dejerine and Gauckler (5) appeared in 1915. Their position lies between that of Dubois and Freud. "Neurasthenia is constituted by a general ensemble of phenomena, which result in the non-adaptation of an individual to any continued emotional cause and the struggle of the individual to bring about such an adaptation" (p. 235). The genesis of all neuropathic states is to be sought in some emotional cause. Often but not always the emotion is sexual. In the psychoneuroses there is no place for drug therapy. All psychotherapeutic measures may be reduced to suggestion and persuasion. Suggestion in the hypnotic state has a limited application. The method par excellence is persuasion. By this method the physician

explains to the patient the mental mechanism by which his symptoms are produced. He appeals to the patient's reason and attempts to give him a rational basis for a renewed voluntary control of himself. Allied to the work of Dejerine and Gauckler is the much less satisfactory treatise of Burlureaux (3). His scheme of mental treatment involves: (a) the physical and mental examination; (b) an optimistic attitude on the part of the physician; (c) the removal of the patient from the milieu in which the disease was engendered (this may mean the actual isolation of the patient from parents and friends); (d) removal of external and internal obstacles to the cure. All this is to be done mainly by simple conversation. Hypnotism may be at times called in as an auxiliary method. Father Raymond (17), chaplain to the Kneipp Institute at Woerishoven, has written a work intended for the perusal of the patient rather than the physician. It touches especially on religious difficulties. With him "psychotherapy undertakes to restore the lost power not by a stroke of the magic wand, but by means of patient and persevering efforts it leads a person on little by little to regain self-control and to become as far as possible master of himself once more. Kindly interest and persuasion are the methods advocated. Ferrari (8) reports the cure of four cases by persuasion and suggestion along with such simple expedients as "attracting the attention" to the normal side by stroking the other in a case of hemicrania.

Dejerine's position that there is no place for drugs in psychotherapy has not found universal acceptance. Vogt (22) maintains that it is never lawful to omit drugs in psychotherapy. Their use in psychotherapy should, however, be somewhat different from their administration in the presence of an organic lesion. One should never attempt to treat transitory symptoms by special remedies. Nor should a psychogenetic disturbance of cardiac activity be treated like a real physical insufficiency. One should direct his treatment towards tonics and general strengthening measures.—The reason for this, he maintains, lies in the fact that "feelings, sensations and emotions are compounded of mental and bodily elements"; and as Wundt has pointed out the consciousness of the ego is a continuous chain of external bodily sensations and internal experience. Legrand (13) writes from the standpoint that psychotherapy is essentially suggestion and as such may and should be reinforced by other measures. It should never be employed alone. Among the physical adjuvants he attributes a special value to a sojourn in mountainous altitudes.

Various writers enter into the question of the real cause of psychotherapeutic cures. Williams (24) advocates a rational psychotherapy which does not depend upon "suggestion" or morbid anatomy, but on a scientific psychoanalysis and synthesis, a dissection of the mental tendencies until the real root of the fault is detected, followed by a putting of them together pointing in a new direction. At the same time he thinks that "there is no subconscious mind; what does happen is that a set of nerve currents are set up within the brain of which a person is unaware, because his attention is upon the currents elsewhere in the brain." Schulz (18) after a sketch of the history of psychotherapy points out that the value of hypnosis lies in suggestion which can be given without the spectacular accompaniments of mesmerism. He thinks that Dubois's method of reasoning with the patient is to a large extent suggestion. He advocates a method of reeducation in which the entire personality is made over and the use of all methods by which this may be assisted. He thinks the Freudian universal sexual psychoanalysis is to be laid aside and that the aim of all psychotherapy is to lead the patient away from himself. Pfeiffer (14) contrasts the psychotherapy of suggestion with that of reasoning, and argues that both cure by arousing an emotion. Suggestion does not implant an idea, but rather the psychophysical complex of an emotion. So also reasoning, when it cures, does not do so by showing that a fixed idea is absurd, but by provoking an emotional reaction.

Eschle (6), a pupil of Rosenbach, discusses the psychotherapy of functional disturbances of coördination. Every voluntary movement involves the innervation of a group of muscles and the simultaneous inhibition of their antagonists. A disturbance of coördination results when this delicate balance is upset by what Rosenbach terms a perverse innervation, which in the last analysis is to be attributed to the will. In cramp the will has no part, in perverse innervation it has. He advocates as psychotherapeutic measures the punishment of the refractory muscles directly or indirectly by painful faradic stimulation or by the use of bad-tasting or evil-smelling drugs such as asafoetida. He would supplant the conviction of organic insufficiency with the assurance of normally functioning organs. Such procedures as Frenkel's exercises are included under the name of psychotherapy. In general he seeks to help the "will" to reëstablish the disturbed balance, but pays no attention to what the psychoanalytic school would call etiological moments.

Healy (10, 11, 12) has opened up a distinct field of psychotherapy in the application of psychological analysis to the problems of juvenile delinquency.

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RECENT LITERATURE ON HYPNOTISM

BY H. C. MCCOMAS

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Remarkably little has appeared in the last five or six years which deals directly with hypnotism. The interest which formerly gave rise to a prolific literature has been diverted into other lines, chiefly psychotherapy and psychoanalysis. This is unfortunate in that it brings hypnotism with all of its difficulties and inconsistencies into other lines of research without first clearing away its own obscurities.

How inchoate the subject is at present is well illustrated by the articles of Bernheim and Claparède and the resulting Conference in Munich upon the "Definition, Psychological Interpretation and Therapeutic Value of Hypnosis" (3), Bernheim (2) had maintained that hypnosis is not a peculiar and unique phenomenon. It is nothing more than a sleep brought on by suggestion. The so-called hypnotic phenomena, catalepsy, anaesthesia, suggestibility and hallucination are to be obtained from suggestible subjects in the waking state. The hypnotic state has no particular properties. It differs, when genuine, in nothing from natural sleep. It has no special therapeutic value, though it is serviceable in certain cases.

Claparède (5) found this conception inadequate and contended that hypnosis is sufficiently unlike other psychic states to warrant a sharp distinction. He sought to relate it to catalepsies in animals and believed both go back to a common phylogenetic origin.

These divergent views are amplified in the Munich Conference. Here Forel opened the discussion by insisting that hypnosis is unlike normal sleep. It is induced by an operator and controlled by him. From 98 to 100 per cent. of all normal persons are susceptible and it has a therapeutic value in itself and in the suggestions it permits.

In the discussion which followed Bernheim, Claparède, Trömner, Dupré, Frank, de Montet, Vogt, and others took part. The consensus of opinion did not bear out Bernheim's position.

Bjerre (4) attempts an analysis and explanation of hypnosis based upon characteristics which are analogous to those of the foetal life. Hypnosis from this point of view would represent a return to pre-natal passivity in which automatic functions predominate.

More significant is Mangold's (7) work, in what he calls "animal hypnotism." He succeeded in inducing a cataleptic state in chick-

ens, doves and guinea-pigs. The animals, however, seemed to retain some of their instinctive activities despite their apparent immobility. His further work (8) shows the broader possibilities of this type of investigation, especially in the death-feigning instincts. Since the cataleptic state may be produced in animals which have no cerebrum the psychic factor is unimportant; nevertheless, Mangold holds that his more typical forms of animal hypnosis must be ranked beside the human and studied in that light.

Smirnoff (9) tried the common experiment of forming a blister upon the arm by suggesting a burn. He found little difficulty in getting results with one subject upon whose arm a larger blister formed in response to suggestion than from an actual burn.

A series of experiments by Alrutz (1) upon one subject demonstrates the influence of the operator upon the subject in an unique way. The subject was covered with an opaque cloak, the ears were stopped with cotton and a sheet of thick glass was placed above one arm. After hypnotizing the subject passes were made above the glass. These produced an insensitivity in the arm and an increased sensitivity in the opposite arm. This effect was also obtained by an operator who did not know what results to expect. Alrutz believed that his subject had no clues from any of the senses concerning the passes and that he also had no information concerning them. He believes the phenomena are due to a form of nervous energy emanating from the operator's hands.

Wilkinson (10) reports a good example of heightened sensibility and a well-nigh incredible case of astuteness in post-hypnotic conduct.

Moral regeneration was attempted by Hopkins (6) upon some London and New York gangsters. The boys responded rather well when their environment was changed to enable them to live out the suggestions made in hypnosis.

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TESTS

BY FRANK N. FREEMAN

Methodological Discussions.—The most thoroughgoing article which has yet appeared upon the theoretical foundation of the age placing of tests, such as is involved in the Binet-Simon Scale, is the pair of articles by Otis (28). Otis argues that tests should be placed at the age at which 50 per cent. of children pass them, and that the empirical choice of any other standard, as 75 per cent., is due to an error in scoring. He discusses at length the rate of mental development, the relation of the rates of different individuals and deduces by means of a number of diagrams the proportion of individuals at various ages above and below the standard age who should pass a standard test. The practical outcome is a chart which is designed to be a guide in placing a test at the proper age. The principles of an absolute scale and of an intelligence quotient based upon it, are finally laid down. Kelley (20) adds that the criteria of the placing of single tests are different from those which apply to groups of tests, and that the probability that an individual will pass all the tests standardized for his age depends on the degree of correlation between them. Yerkes and Wood (42) compare the coefficient of intelligence and the intelligence quotient with other means of calculating mental age, and give distribution tables of coefficients of intelligence for the Point Scale. Pintner and Patterson (31) discuss the relation of rates of mental development at different levels in their relation to the mode of expressing mental age and make application to both the Binet and Point scales. Doll (13) presents data from feeble-minded and normal cases to show that the intelligence quotient may vary up or down in successive years.

Ruml (33) brings to light a Pearson formula which makes it possible to determine how closely a test will correspond with some

other standard—as vocational or scholastic—in dividing a group into two sections.

Seashore (34) presents results of experimentation to show that simple, elementary forms of discrimination do not alter their threshold with practice, and he believes that tests would show that they do not change with age. The implication is that such tests are more desirable than less elementary ones.

The symposium (35) deals mostly with the merits of the age principle and the point scale principle, but includes a good deal of information concerning problems and methods which are being pursued by various workers.

The nature of the articles by Pintner and Paterson (30) and Bronner (5) is indicated in the titles.

Standardization or Evaluation of Old Tests.—Haines (18), Kohs (25) and Martin (26) contribute to the evaluation of well-known test series. King and Gold (23) present percentages of passes, and frequencies of answers similar to the Kent-Rosanoff free association lists, for 158 opposites, obtained from tests of 100 adults. Doll (12), Wallin (40, 41) and H. H. and M. H. Young (43, 44, 45) contribute to the standardization of modifications of the Seguin form-board. Bruckner and King (7) give statistics upon what they call the Fernald form-board, and Bronner (6) criticizes their conception of the test and method of giving it. Anderson and Hilliard (1) use a number of common tests.

New Tests.—A variety of ingenious tests for originality or initiative are described, and the results of their application to adults are presented by Chassell (9). Porteus has devised and partially standardized by age a number of puzzles of the maze type which he seems rightly to regard as capable of testing foresight or prudence, and as a good supplement to tests of the Binet type. Cunningham (10) finds the results of the Porteus tests to agree well with the Binet scale results. Dearborn, Anderson and Christiansen (11) describe puzzles derived from the form-board type of test which can be arranged to present problems of varying difficulty. Dunham (14) describes a new form-board. Kelley (19) describes a test which enables one to measure the initiative, originality and persistence in construction, rather than the ability to carry out set tasks. Kent (21, 22), Trabue (39) and Miles and Butterworth (27) have devised and standardized tests the nature of which is indicated in the titles of their articles. Thorndike's tests (37) deal with the judgment of geometrical form, and with the appropriateness and beauty (or

lack of ugliness) of lines of verse, which were written to complete a couplet. Haberman (15) presents a long list of unstandardized tests, classified according to assumed "mental faculties." Haines (16, 17) modifies some of the Binet tests used in the Point Scale, and adds a few others to make the scale applicable to the blind, and gives statistics. Parker (29) gives a useful description of the inaccessible Rossolimo tests. Terman's book (36) needs no identification.

Bell (2) and Bingham (3) present rather discouraging results of attempts to diagnose the ability of college freshmen. Bonser (4) has followed up several hundred of the pupils he tested in 1906 and finds their scholastic career to correspond roughly to their test rankings. Thorndike (38) finds the results of the Binet scale to correspond closely to tests of language ability, but not so closely to constructive ability, and concludes that they are one-sided.

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COLOR FILTERS AND NEUTRAL FILTERS FOR VISUAL EXPERIMENTS

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In a discussion with a group of experimental psychologists recently the need of suitable filters for color experiments arose. As Johnson (5) stated the physicists seem to be more familiar with such filters than psychologists, although the knowledge is probably more valuable to the latter. The psychological literature is full of experiments dealing with color, but in only a small percentage of such studies have data been given as to the exact quality of the colored stimuli. In order to duplicate experimental procedure or to compare results of different experiments it is essential to know at least some of the properties of the original stimulus. It is desirable to have a source of colored light that may be duplicated in any laboratory and this may be obtained by means of a standard light source and the use of filters easily duplicated.

The lamp problem has been very well taken care of in the recent developments along that line and the filter problem has also made rapid progress. Some of the first colored filters made were designed to reduce artificial light to daylight and this work probably began with the use of blue chimneys on kerosene lamps. Much attention has been given to this subject during the past fifteen years and the article by Luckiesh and Cady (6) gives a good treatment of this subject and contains a useful bibliography. Another line of work to demand color filters has been photometry and numerous articles have been written on this subject. A set of photometric filters for use in the photometry of the various electric glow lamps is described by Mees (8) and also in the Wratten Light Filter book (14). These filters are used to reduce daylight and the lamps to

color match and may be used in various experiments where it is desirable to reproduce certain light conditions.

Throughout the literature there have been numerous articles describing experiments with various absorbing media and until recently most of the experimenters used absorption cells with aqueous solutions of various aniline dyes. But previous to the work of Uhler and Wood (10) the aims and methods were so variable that not even a complete collection of data would have given a satisfactory collection of spectra. These workers began an organized research and published their results for some inorganic substances and a long list of organic dyes. Their work centered largely on the ultra-violet and certain parts of the visible spectrum so that much of the region of the longer wave-lengths remained for other investigators. Ives and Kingsbury (4) point out the difficulties and precautions necessary in using absorption cells and on the whole we are forced to agree with Ives in an earlier statement concerning absorbing media. Ives says (3) that only two kinds of absorbing media are very practicable: colored glasses and dyed films, either gelatine or collodion. To each of these there are several objections and the practical problem as Ives saw it was in combination of the two media.

The dyed films have had two disadvantages: their absorptions are apt to be quite narrow and they are apt to be unstable, *i. e.*, fade when exposed to light. Numerous experiments have been tried on dyed film and very satisfactory results have been obtained. Hnatek (1) investigated over sixty aniline dyes and found twenty-four suitable for the preparation of gelatine filters. He defines the concentration of the color by indicating the number of grams of coloring matter uniformly distributed over a square meter of filter surface. His results, however, show that narrow ranges could be obtained only by combining several filters and in these cases the transmitted light was too faint for practical purposes. Schulz (9) used gelatine filters to isolate the bright bands of the mercury vapor lamp but unfortunately he does not describe how he obtained the filters. Johnson describes a set of available filters for use with the mercury lamp and they seem to be quite satisfactory.

Probably the most extensive work on filters was that carried on by Mees (7), and which he has continued in the research laboratory of the Eastman Kodak Company. The research was started to extend the work of Uhler and Wood and to get a complete set of filters for the visual portion of the spectrum and infra-red as well

as the ultra-violet region. In the original work Mees published data on about seventy filters and this list has been extended to nearly one hundred. The data on these filters have been collected and published in book form, so as to be available to those interested. In the publications (12, 13, 14) these filters are described and various practical uses are given. The Wratten Light Filter book is particularly valuable, as it gives complete information concerning the filters: the spectro-photometric curves; the purpose for which the filter may be used; stability when exposed to light; the per cent. transmission for wave-lengths between 400 and 700 and also the data for combinations of filters. Each filter is listed as to its stability to light. "Quite stable" indicates that no change occurs when the filter is exposed to daylight and sunlight for twelve months. "Stable" filters do not change in six months, "moderately stable" three months, and "somewhat stable" one month. A few filters will not stand exposure at all, but are so indicated in the table. The spectro-photometric absorption curves and the table of transmissions enable an experimenter to choose the filters for his special purpose and psychologists and physiologists will find in the list a large number suitable for their special purposes.

These filters may be used with light sources which are found in all laboratories, as tungsten, gas-filled tungsten, carbon and arc lights as well as special light sources. Nernst glowers and concentrated filament lamps¹ give intense narrow sources of light that are very satisfactory. For monochromatic stimuli numerous sources are available, such as sodium for yellow and lithium for red. The spectra of such sources show widely separated lines which can be isolated by means of filters. It is often convenient to use special arc lamps or spark gaps with certain elements at the terminals. The most commonly used source in this class is the mercury-vapor lamp. This lamp used with the Wratten mercury monochromats offers a very suitable monochromatic source for yellow, green, blue and violet. (Johnson suggests an auxiliary source for red; or other sources such as a cadmium or zinc spark in air could be used.) Four bright bands predominate in the mercury

¹ When using special tungsten lamps a variable resistance and a voltmeter should always be used in the circuit. A very short time on voltage higher than the rating of the lamp will burn it out. When first turning on the current the resistance should be set so that the voltage is below rating and raised gradually to the rated voltage. When permissible the lamp might be run slightly under and at no time should the voltage be allowed to remain long at over rating. The life of the lamp is also increased if run under voltage while not in actual use.

spectrum and are: yellow, 5790 and 5770;¹ green, 5461; blue-violet, 4358; and deep violet, 4078 and 4046. The yellow mercury monochromat, Wratten number 22, transmits only the yellow lines, the violet, No. 50, transmits 4358 so that it overpowers the other violet lines, number 77 filter transmits 72 per cent. of the green and only $\frac{1}{2}$ per cent. of the yellow, and filter 77A transmits only the green line. (The green line of a mercury vapor lamp is the most powerful monochromatic source known.)

The Wratten filters are prepared by coating gelatine containing a known concentration of dye upon plate glass. After drying the film is stripped from the glass and tested for accuracy of depth of color by means of a special instrument in which it is compared with filters which have been standardized upon the spectro-photometer. Only filters which accord with the standard within certain fixed limits, the extent of these limits depending upon the filters but always being less than that visually perceptible, are allowed to pass, and in this way the Wratten filters always correspond rigidly with their specifications. The gelatine film can then be used either alone or cemented between glass of various degrees of optical perfection according to the purpose for which the filter is required. Wratten filters are supplied in two standard qualities of glass. For producing color stimuli the plain film can be fastened between strips of ordinary glass, since unprotected gelatine films get soiled by handling and are apt to crack or tear. In addition to the regular filters the laboratory has a considerable stock of special filters and is prepared to coöperate as far as possible with any experimental or other laboratory. The laboratory can also supply neutral filters which transmit any per cent. of the incident light desired. These filters transmit all colors to about the same extent and are used to diminish the intensity of the light. The writer used a set of such filters in investigating the least perceptible intensity of light and the least perceptible difference under various conditions. For the absolute threshold a neutral wedge was used which was made on the same principle as the neutral filters but having a range of density from .04 to 7.5, i. e., transmission from 92 per cent. to 3.2×10^{-6} per cent.

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¹ Wave-lengths expressed in Ångström units (\AA . U.), one ten-millionth of a millimeter or 10^{-8} cm. Wave-lengths are also expressed in micromillimeters ($\mu\mu$), 10^{-7} cm., and microns (μ), 10^{-4} cm.

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SPECIAL REVIEWS

Character and Temperament. J. JASTROW. New York: Appleton, 1915. Pp. 596. \$2.50.

Professor Jastrow's book is undoubtedly the most extensive analytical account of character and temperament which has so far appeared. The introductory chapter calls attention to such fundamental factors as heredity and environment, central and derivative traits, the biological derivation of traits, emotional and intellectual traits, etc., which are responsible for the composite of an individual character. The author treats at some length each of these lines of cleavage. Thus he considers the causal relations of emotion, emotional expression as instinct, and emotional characteristics of conduct. One chapter contains an account of the interrelationship of social environment and the individual character. The exposition brings out no new principles, either analytical or extra-psychological.

It would promote the development of psychological inquiry concerning character traits if contributors would devote themselves

to an empirical scientific study of character by means of objective judgments with appropriate interpretative analyses, rather than to write more arm-chair philosophy about temperament. Speculative analyses on character and temperament will be justified only when we have sufficient empirical data to build upon. Even then, every analytical account should justify itself by bringing forth some new relationship. A more fruitful procedure to follow in this regard is illustrated by Webb's recent study of character and intelligence, in which its author avails himself of the best statistical methods for the specific purpose of making a contribution. If Professor Jastrow's book lacks content it is not due to any incompetence on the part of its author for his style of exposition is indisputably good, but he who attempts to write a six-hundred-page volume on an unexplored branch of psychology must necessarily find his task troublesome. The subject of character and temperament is perhaps of more far-reaching interest than any other field of psychological inquiry, but we have not as yet even formulated the proper categories by which to study it. Correlation statistics with objective measurements will be the means of gathering an extensive body of factual material on the subject and when this material is organized a popular account will be in order.

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The Psychology of Sound. H. J. WATT. Cambridge: University Press, 1917. Pp. viii + 241.

In this volume the author has given a comprehensive theory of hearing as based upon his well-known doctrine of sensory integration. The contents, after a brief preface, are an introduction followed by chapters on "Auditory Sensations and their Attributes," "The Analysis of Bi-tonal Masses," "Distance and Interval," "The Analysis of Tonal Sequences," "The Further Study of Tonal Masses," "Melody," "The Formation of Scales," "Physiological Theories," and "Binaural Hearing." In a following chapter each of the sections of the preceding is summarized in a brief paragraph, while another chapter furnishes a short summary of the whole. Then comes an "Untechnical Account of Results," and a final chapter on "'Pure' Psychology." There is a list of 159 works cited in the text, while an appendix is largely devoted to a searching critique of Köhler's recent theoretical formulations. The volume closes with indexes of authors and subjects.

Watt conceives "tone" as a volumic mass with a predominant

intensity defining its pitch. There is but one quality for all sound. Pitch is "systemic order," and is analogous to that attribute which in the cutaneous and visual senses furnishes the basis for localization. Volume, on the other hand, is "systemic extension," which in vision furnishes the basis for cognitive space. The tone is like a molecule containing various atoms. If the molecule is balanced and a central atom predominates, this gives to the whole a pitch. Among the subsidiary atoms within the mass are those that correspond to the partial vibrations, and constitute what "pitch-blends." When two or more masses of tone unite as in a chord, we have a more conspicuous overlapping of their respective volumes. "A very irregularly balanced mass of elementary sound 'atoms' in which more or less vaguely defined predominances (pitches) may appear" constitutes a noise. Vowels are reckoned between these two, as suggested by Jaensch's experiments.

Volume appears as the central feature in Watt's explanation of fusion and interval. That the volumes are graded with reference to their pitch ordinals by progressive increments from higher to lower tones. It follows that the volume of any high tone is always entirely included within the volume of any lower tone, and, indeed, in such wise that "all simultaneous tones have a common upper limiting 'atom' of sound and coincide downwards from that point in the proportion of their relative volumes. Their predominances or 'pitches' stand centrally in their volume. Fusion is determined by this coincidence and the resulting balance of the lower limiting and predominating points of the higher tone round the predominance of the lower" (p. 207). Whereas fusion rests upon the balance of resultant volume, interval depends upon the proportion between the parts of the total mass. Thus thirds and sixes are of approximately equal balance, or fusion, but they are very different intervals.

Watt argues that the musical intervals are based and standardized upon divisions of the octave which have been variously achieved and then familiarized until known. The pentatonic and heptatonic scales of Java and Siam are attributed in origin to a division of the octave by fifths from the lower and from the higher tone. This results in the scale *c-f-g-c'* with the two extreme intervals larger than the middle one. A division of the larger intervals in two leads to the pentatonic scale of equal interval, while a division in three, based perhaps upon an attempt to duplicate the *f-g* interval thrice within the larger intervals, leads to the heptatonic scale. The intervals of

the fourth and of the whole tone are regarded as guides in both cases, but the prime motive for a scale of equal temperament is always that of "complete transposibility," just as it has been in the case of our own chromatic scale. "There is in all this no contradiction with our own doings in the matter of scales. We need postulate no logarithmic inspirations or root extractions, nor do we need any mysterious 'feelings' for equal intervals. That 'feeling' is given along with the consonance of fusion in any interval" (p. 137). One might note, however, that while the derivation of pentatonic and heptatonic scales may perhaps be suggested by the "natural" division of fourths and fifths, the hexatonic or "whole tone" scale of equal temperament is not. This scale, observed by Myers among the islanders of the Torres Straits,¹ is, to be sure, less well authenticated than the scales of Java and Siam, but we know its musical possibilities from the compositions of Debussy, and should it also prove to be an "original" mode, it would seem to require a sense of equal interval quite distinct from all fusional presuppositions.

Watt rejects the conclusion of Abraham and v. Hornbostel that *distances* are judged equal when they show the same relations of vibrational frequency. "It must be evident," he writes, "that Abraham and v. Hornbostel, in the face of immense, if not insuperable, difficulty of uncovering the primary distances of pitches, have simply wandered unwittingly into mere interval, which is of course a matter of relations or proportions of volume" (p. 83). He gives the proper method of dividing the true tonal distance into equal parts as that of determining where the predominant orders of the two tones lie, and then finding what tone would have a predominant order falling just midway between these. Thus the middle pitch between two *c*s is found to be an *f*, and between *c* and *a* an *e*; between *c* and *g*, *e^b*. He admits that when we compare two theoretically equal distances we do not readily detect anything identical, though it may be there for all that, for "no matter what we do, the basis of proportion, *i. e.*, interval, and from habit the attitude towards proportion are both there; and they may well make the proper abstraction of distances impossible. Perhaps somebody will succeed with the abstraction some day" (p. 84).

Melody is a succession of notes and involves *motion*. Successive intervals are musical for the same reasons that the binary mass may fuse. "It is clear then that relations exist between successive tones that will inevitably standardize the range of successive

¹ Cf. Stumpf's *Anfänge der Musik*, note 29, p. 94.

pitches in exactly the same way as the range of simultaneous pitches is standardized by the volumic outline of tonal masses" (p. 87).

In the development of his physiological theory of hearing Watt rejects the resonance hypothesis and, regarding the basilar membrane to be very elastic, finds therein the possibility of many different depths of bulge being occasioned upon it as it is set in wave motion by the action of the stapes. The wave motion is supposed to have "a constant linear rate for all tones so that the distance traversed before the expiry of a wave is proportionate to the vibratory frequency of the tone" (p. 163). Thus the pattern of the bulge on the membrane is directly analogous to that which was used as a figure for the "molecular" form of a tone. "Every physical tone produces a wave of depression of the basilar membrane beginning from the basis and extending along in proportion to its pitch, with a point of maximal depression in the centre round which relative intensities are arranged symmetrically and decreasingly" (p. 208).

Watt's theory stands or falls on his conception of volume, yet this does not appear to be founded upon empirical evidence. When he assumes the coincidence of volumes to give a resultant pattern of balance or unbalance, he is dealing with a theoretical figure, ingenious, but not altogether convincing. Rich in his study of tonal volume¹ has found that volume differences can be readily judged on an attributive basis, and that their differential increments follow Weber's law. This result is not necessarily at variance with Watt's statement: "it seems natural that . . . volumes should really decrease evenly with rise of pitch, as they seem to do, especially since the predominance of pitch seems to be central to each volume" (p. 82). The question of distances, since they depend upon the pitch salients is somewhat more complicated. Watt's conclusion "that distances are not only not equal in octaves, but rather about halved in size for any interval with each octave upwards" (p. 82). Such a theoretical conclusion must await empirical confirmation.

The book remains an important contribution to the psychology of sound. In a most thorough and painstaking manner the author has collected and sifted a large amount of experimental evidence for the purpose of reducing it to systematic form. His conception of the tonal mass with its attributive variations, together with his rejection of a multiplicity of elemental qualities for sound, seems

¹ Cf. *J. Exper. Psychol.*, 1916, 1, 13-22.

to the reviewer distinctly promising. If the conclusions drawn from his conception of volume are somewhat less convincing, the basic notion of a volumic pattern is yet an ingenious and suggestive incentive to further experimental research.

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DISCUSSION AND REPORT

THE PLACE OF THE SELF IN PSYCHOLOGY

The following paragraphs embody the result of one of my attempts to test the claim of the self-psychologist that the fundamental conception of psychology, as stated by the structuralist or the functionalist, carries with it the implication of a *self*, which should receive open recognition as the fundamental base from which all psychological edifices are built up.

In substantiation of this view, I have traced the various steps by which I discover the implications of the definitions that are very far from being those of self-psychology. If one introspects to see what images and supplementary statements are aroused in him as he seeks to assimilate a definition, he comes upon some ideas, images, mental content, etc., which, given verbal form, become assertions. Thus, by some such process as the following, I discover what are to me the implications of McDougall's definition: "Psychology is best defined as the positive science of the conduct of living creatures." When I read this definition, I respond first to three words, "positive," "conduct," "living creatures." "Positive" calls to mind "positivism" in philosophy, and almost at the same time, a hazy mass of images related to the different sciences that I have studied. "Conduct" at first calls up the word "ethics," then vague, hasty images of various dramatic situations between selves. These I dismiss as not very pertinent to the definition, and in their place the word "activity" appears as a verbal image, and that brings with it complex visual images of various reactions to stimuli. This is accepted as pertinent. "Living creatures" calls up fragments of different animals. When I fit together these three words, in the endeavor to get a clear meaning, the definition seems to be too large to fit the desired subject-matter. But ignoring this difficulty, I may say at once that when I try to cause clear images to emerge from the words "conduct" and "living beings," I imagine some definite situation, as a frog withdrawing his leg from a lighted match, or a human being lifting weights, and uttering sounds by

which he indicates which is heavier. But invariably, even in the case of the lower animals, I add to this the question, "How does he feel as a whole?" "What does he think of his experience?" (The questions are never so explicitly put, but in significance they are somewhat like the formulated questions.) They are accompanied by, but not identified with, kinæsthetic sensations like those which one has if one imagines oneself getting on the inside of something, a house, a pipe, a sewer, or an earthworm. It would be difficult clearly and fully to introspect this mental process, even if space permitted, but it is something which accompanies all my contacts with "living creatures." Hence the definition comes to mean for me "That procedure, rich in array of facts, by which I get on the inside of 'living creatures.'" Now "living creatures," when worked on by science, could not be worked on *en masse*. One creature at a time would have to be studied.

Here we have a much abbreviated account of the processes through which a reader's mind may go in the course of his reading and assimilation of a definition of psychology. The introspection here given is very incomplete, but it touches upon the main contents of my mind, when considering McDougall's definition. Even in the case of this definition, which is so far removed from a definition satisfactory to self-psychology, the idea is conveyed that the inner life of the individual is to be studied, by means of its objective tokens of existence. The inner life, in my own case, can only be understood if it is regarded as a self. This I should call the implication of McDougall's definition. Similar steps lead me to the observation of a similar implication in the case of other definitions. In the case of certain definitions—those of Wundt and Ward, for example—the implication is observed with few or no intermediate steps. In other cases, as in that of Titchener's definition, some such steps are necessary.

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PSYCHOLOGY AND NATIONAL SERVICE

Among the many scientific problems which the war has forced upon the attention of our military authorities there are several which are either psychological or present a psychological aspect. In the opinion of experts many of these problems are immediately soluble and it therefore becomes the duty of professional psychologists to render national service by working on such problems. For this reason a committee on psychology has been organized with the

approval of the council of the American Psychological Association, by the National Research Council. This committee consists of J. McKeen Cattell, G. Stanley Hall and E. L. Thorndike from the National Academy of Sciences; Raymond Dodge, S. I. Franz and G. M. Whipple from the American Psychological Association, and C. E. Seashore, J. B. Watson and R. M. Yerkes, Chairman (member of the National Research Council) from the American Association for the Advancement of Science.

At the first meeting of the committee, it was voted "that whereas psychologists in common with other men of science may be able to do invaluable work for national service and in the conduct of the war, it is recommended by this committee that psychologists volunteer for and be assigned to the work in which their service will be of the greatest use to the nation. In the case of students of psychology, this may involve the completion of the studies on which they are engaged."

It is the function of this general committee to organize and, in a general way, supervise psychological research and service in the present emergency. Problems suggested by military officers or by psychologists are referred by the committee to appropriate individuals or institutions for immediate attention. Already at the suggestion of the council of the American Psychological Association the chief psychological laboratories of the country have been offered to the committee for such use as the military situation dictates. Moreover, the membership of the American Psychological Association, in response to a letter addressed to it by the council, has responded most promptly and heartily with offers of personal service.

At a meeting held in Philadelphia, April 21, the council of the American Psychological Association, in addition to approving and urging the appointment of a committee on psychology for the National Research Council, authorized the organization of twelve committees to deal with various important aspects of the relations of psychology to the war.

The list of committees with their personnel, so far as at present announced, follows, together with brief comment on the status of their work:

COMMITTEES

Committee on Psychological Literature Relating to Military Affairs.—It is the function of this committee to prepare bibliographies and abstracts of important psychological military contributions for the immediate use of committees, individual investigators, and for publication. Chairman, Madison Bentley, University of Illinois. Dr. Bentley already has rendered valuable service to several of the committees.

Committee on the Psychological Examining of Recruits.—The first task of this committee is the preparation and standardization of methods and the demonstration of their serviceableness. Chairman, R. M. Yerkes, Harvard University, W. V. Bingham, H. H. Goddard, T. H. Haines, L. M. Terman, F. L. Wells, G. M. Whipple.

This Committee has prepared a method of group examining, and also varied methods of individual examining. The work, covering a period of four weeks, was generously financed by the Committee on Provision for the Feeble-minded. The methods are now being tested in three army camps and one naval station. The expense of this initial trial, which is made primarily for the further development and perfecting of the methods, is met by an appropriation of twenty-five hundred dollars made by the Committee on Furnishing Hospital Units for Nervous and Mental Disorders to the United States Government. At the present writing, the Surgeon-General of the Army awaits lists of psychologists who are both adequately prepared and willing to serve as psychological examiners.

It is the conviction of the committee that the psychological examiner, by applying specially prepared and adapted methods to recruits in the camps, should obtain measurements valuable alike to line officers, to general medical officers, and to the special officers in charge of the psychiatric hospital units.

It is assumed that the work of the psychologist, although not strictly medical in character but instead vocational, educational and social, will supplement that of the medical examiner by supplying him with information otherwise not available. Further, the psychologist may aid the psychiatrist by detecting and referring to him those individuals for whom careful psychiatric examination is obviously desirable.

Committee on the Selection of Men for Tasks Requiring Special Skill.—This includes the selection and promotion of officers, as well as the choice of men for varied kinds of skilled service. Chairman, E. L. Thorndike, Columbia University, J. C. Chapman, T. L. Kelley, W. D. Scott.

A new method of selecting officers devised by Dr. Scott is now in use in many of the Officers' Training camps.

Committee on Psychological Problems of Aviation, Including Examination of Aviation Recruits.—Chairman, H. E. Burtt, Harvard University, W. R. Miles, L. T. Troland.

Work looking toward the development and thorough testing of methods for the selection of aviation recruits has been authorized by the government and already is in progress in at least one of the institutions where the recruits are being trained.

Committee on the Psychological Problems of Incapacity, Especially Those of Shock, Reeducation and Vocational Training.—Chairman, S. I. Franz, Government Hospital for the Insane, J. B. Watson, K. S. Lashley.

The task proposed for this committee is a large and difficult one and the chairman plans to organize, in intimate relations with various military activities and agencies, a committee which shall be competent to deal with the varied scientific problems of incapacity.

Dr. Franz has himself developed successful methods for the reeducation of certain paralytics, and according to our information his methods are now used by the Military Hospitals Commission of Canada. It is greatly to be hoped that his own country may be equally ready to avail itself of these methods, and that it may adequately prepare in advance for the extremely important as well as difficult task of rehabilitating maimed and paralyzed soldiers and sailors.

Committee on Psychological Problems of Recreation in the Army and Navy.—Chairman, G. A. Coe, Union Theological Seminary, W. C. Bagley, H. L. Hollingsworth, G. T. W. Patrick, J. H. Tufts.

This committee will serve the national cause by coöperating in every profitable way with the committee on military recreation of the Y. M. C. A., and with such other agencies as are immediately concerned with this kind of military aid. Psychologists will find abundant opportunity for the study of psychological aspects of recreational problems.

Committee on Pedagogical and Psychological Problems of Military Training and Discipline.—Chairman, C. H. Judd, University of Chicago.

Committee on Problems of Motivation in Connection with Military Service.—Chairman, W. D. Scott, Northwestern University, H. S. Langfeld, J. H. Tufts.

Committee on Problems of Emotional Stability, Fear and Self-control.—Chairman, R. S. Woodworth, Columbia University, W. B. Cannon, G. S. Hall, J. B. Morgan, J. F. Shepard.

It is probable that in addition to dealing with the special problems of emotional stability this committee will find it desirable to undertake a careful study of incorrigibility.

Committee on Acoustic Problems of Military Importance.—Chairman, C. E. Seashore, University of Iowa, R. M. Ogden, C. A. Ruckmich.

Already the chairman of this committee has interested himself in the relations of the principles of acoustics to various naval situations. Methods of localizing sounds and their utilization for the detection of submarines, the identification of guns, and the locating of batteries are clearly important. These questions are under investigation by the Physics Committee of the National Research Council, with which Dr. Seashore's committee will coöperate.

Committee on Visual Problems of Military Significance.—Chairman, R. Dodge, Wesleyan University, R. P. Angier, H. A. Carr, L. R. Geissler, S. P. Hayes, G. M. Stratton, L. T. Troland.

Chairman Dodge has devised and perfected an apparatus for the measurement of various important aspects of the naval gunner's reaction. This is now installed for trial on a number of battleships. The Committee has also been requested to prepare and recommend to the Navy methods for the selective examining of men for various kinds of service. This work is in progress and its results will shortly be reported to the officials directly concerned.

If the war continues for as much as a year American psychologists will have opportunity to serve importantly, not only in the examining and classifying of recruits but also in the selection of men for positions of responsibility, and in the choice and training of aviation recruits, naval gunners and others in skilled service. It is no longer a matter, as at first appeared to be the case, of inducing military authorities to accept methods of psychological measurement, but instead primarily one of meeting their expressed needs and requests for assistance.

As psychological research along such lines as have been indicated above progresses and as the applicability and serviceability of methods are demonstrated and rendered increasingly clear, it is probable that effective use can be made by the government of all scientists who are skilled in the study and control of human be-

havior. For after all the human factors in war are as important as are the mechanical and it cannot be doubted that brains and not brawn will decide the great conflict.

R. M. YERKES,
Chairman

NOTES AND NEWS

THE June number of the *BULLETIN*, dealing with psychopathology, was prepared under the editorial supervision of Dr. E. E. Southard, of the Boston Psychiatric Hospital.

THE degree of doctor of Science, *honoris causa*, was conferred upon Dr. E. E. Southard at the recent commencement of the George Washington University.

THE position of Professor C. S. Yoakum in the University of Texas has been changed from associate professor of philosophy to associate professor of psychology. J. U. Yarbrough has been appointed instructor in place of Miss Alda Barber, resigned.

THE following appointments have been made at the Carnegie Institute of Technology: B. Ruml, instructor in psychology; G. M. Whipple, professor of applied psychology and acting director of the bureau of salesmanship research (first semester only); A. J. Beatty, research assistant. L. L. Thurstone has been promoted to an instructorship in psychology. W. D. Scott will remain at the Institute during the coming year.

A department of psychology is to be organized at the University of Minnesota. Professor Robert M. Yerkes has been called from Harvard University to the chairmanship of the department. The staff, so far as announced, consists of Professor Yerkes, Associate Professor Herbert H. Woodrow, Assistant Professor Henry T. Moore, Assistant Professor Joseph Peterson, and Instructor K. S. Lashley.

FORMER and present graduate students of the Department of Psychology of Cornell University and a number of his more intimate friends among the faculty met with Professor E. B. Titchener in the Psychological Laboratory on the evening of June 22, to celebrate the completion of twenty-five years of his service to Cornell.

A volume of *Studies in Psychology*, edited by Professors W. B. Pillsbury, J. W. Baird, and M. F. Washburn, and published by L. N. Wilson at Worcester, Mass., was presented to him on the oc-

casion. The book contains the following papers: E. C. Sanford, *A Letter to Dr. Titchener*; M. F. Washburn, *The Social Psychology of Man and the Lower Animals*; W. B. Pillsbury, *Principles of Explanation in Psychology*; C. G. Shaw, *The Content of Religion and Psychological Analysis*; J. W. Baird, *Memory for Absolute Pitch*; R. M. Ogden, *Some Experiments on the Consciousness of Meaning*; R. H. Gault, *The Sense of Social Unity: A Problem in Social Psychology*; H. C. Stevens, *A Revision of the Rossolimo Tests*; L. R. Geissler, *The Affective Tone of Color-Combinations*; H. M. Clarke, *A Note on Recognition*; H. P. Weld, *Meaning and Process as Distinguished by the Reaction Method*; A. S. Edwards, *The Distribution of Time in Learning Small Amounts of Material*; K. M. Dallenbach, *The Psychology of Blindfold Chess*; C. A. Ruckmich, *Visual Rhythm*; L. D. and E. G. Boring, *Temporal Judgments after Sleep*; C. E. Ferree and G. Rand, *The Selectiveness of the Eye's Achromatic Response to Wave-Length and its Change with Change of Intensity of Light*; J. N. Curtis, *Tactual Discrimination and Susceptibility to the Müller-Lyer Illusion Tested by the Method of Single Stimulation*; W. S. Foster, *A Bibliography of the Published Writings of Edward Bradford Titchener*.

After the presentation, Professor Titchener responded with some reminiscences of the early days of the Cornell Laboratory, and in conclusion announced that he had declined acceptance of the chair of psychology recently tendered him by Harvard University.

THE following items have been taken from the press:

PROFESSOR E. H. LINDLEY, of the University of Indiana, has been elected president of the University of Idaho.

AT Harvard University W. F. Dearborn has been advanced to the grade of professor of education.

AT the summer session of Washington University courses are being given by D. E. Phillips, head of the department of psychology and education of the University of Denver.

DR. GEORGE R. WELLS, associate professor in Oberlin College, has been appointed to the professorship of psychology at the Ohio Wesleyan University.

PROFESSOR RAYMOND DODGE, of Wesleyan University, has been appointed to the Ernest Kempton Adams research fellowship at Columbia University.

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